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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/823,674

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EXAMINER

RICE, ELISA M

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/823,674	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> ELISA M. RICE	<b>Art Unit</b> 2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18, 20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7-10, 15-18, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 3-6 and 11-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/05/2008 has been entered.

### ***Response to Arguments***

Applicant's arguments with respect to independent claims 1, 9, and 17 have been considered but are moot in view of the new ground(s) of rejection, the new grounds of rejection consisting of a rearrangement of the elements taught by Heising and Choi. Therefore, most of Applicant's arguments are now moot. See Office Action below for the changes.

### **Applicant's Argument:**

Applicant states on page 11, paragraph 3, that there is no mention of "first and second interpolation pixels." In fact, there is no mention of interpolation pixels, as required by claim 1. Also, there is no weighting "according to relative locations."

**Examiner's Reply:**

Choi discloses a first and second interpolation pixel and this is addressed in the current Office Action as discussed below. The weighting "according to relative locations" can be found in the Heising reference at lines 15 to 21 of the left column, lines 29 to 34 and lines 35 to 36 of the right column in page 95, lines 12 to 18 of the right column in page 99, the first paragraph of the left column in page 100, Figure 2a, and formula 3 and 4.

**Applicant's Argument:**

"Applicant respectfully submits that the Examiner has not met the burden of establishing a prima facie case of obviousness as set forth in MPEP § 2143.03, portions of which are cited as follows: "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 E2d 981,180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is no obvious under 35 U.S.C, 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071,5 USPQ2d 1596 (Fed. Cir. 1988). As the Examiner is aware, "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed

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modification." In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Moreover, "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). (Arguments, last section of page 11 and first section of page 12)

**Examiner's Reply:**

The Choi and Heising reference are both in the same field of endeavor of block-based motion compensation systems and solve the same technical problem of artifact reduction and this is also addressed below. As discussed in the last paragraph of page 100 of the Heising reference, "switching between image warping model and the overlapped block motion compensation allows to deal efficiently with the problem of motion discontinuities."

**Applicant's Argument:**

On the second and third paragraph of page 12, Applicant states that independent claims 9 and 17 are allowable based on the points provided with respect to claim 1.

**Examiner's Reply:**

See the Examiner's Reply provided above with respect to claim 1.

**Applicant's Argument:**

On pages 13 and 14, Applicant states that dependent claims 3-8, 11-16, 18, 20, and 21 are allowable based on their dependency to independent claims 1, 9, and 17 for the arguments provided for claim 1.

**Examiner's Reply:**

See the Examiner's Reply provided above with respect to claim 1.

**Applicant's Argument:**

"The limitations of claim 17 currently include "calculating a candidate interpolation pixel by allocating a predetermined weight to a first interpolation pixel and a second interpolation pixel according to relative locations where the first and the second interpolation pixels are interpolated." The Examiner admits this limitation is not satisfied by Choi, at page 10 of the Office Action. Examination of page 95 (left column) of Heising demonstrates that there is no disclosure regarding "first and second interpolation pixels." In all the cited language on page four of the Office Action, there is no mention of "first and second interpolation pixels." In fact, there is no mention of interpolation pixels at all, as required by claim 17. Also, there is no weighting "according to relative locations."

**Examiner's Reply:**

See the Examiner's Reply provided above with respect to claim 1.

**Applicant's Argument:**

“The Examiner has offered FIGS. 1 and 2 of Heising in response. Applicants respectfully request the Examiner to point out specifically in FIG. 1 or 2 of Heising, where "allocating a predetermined weight to the first and the second interpolation pixels, according to relative locations where the first and second interpolation pixels are interpolated" occurs.”

**Examiner's Reply:**

See the Examiner's Reply provided above with respect to claim 1.

**Applicant's Argument:**

Applicants would submit that there is no teaching to suggest that the technique described in Heising is performed to reduce blurring (Arguments, page 17, section under heading 9)

**Examiner's Reply:**

Heising has disclosed that the used motion model will be reextracted when each of the subblocks is quadtree segmented, then some blocks which have not been previously selected as OBMC will be selected as OBMC, that is, this additional technical feature has been disclosed by Heising.

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 9 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit<sup>1</sup>[1], relying upon Supreme Court precedent<sup>2</sup>[2], has indicated that a statutory “process” under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the “machine or transformation test”, whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590”). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. That is, the method includes steps of extracting, retaining, comparing, detecting, etc. is of sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally, or without a machine. The cited claims do not positively recite any structure within the body of the claim which ties the claim to a statutory category. Furthermore, the examiner suggests that the structure

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needs to tie in the basic inventive concept of the application to a statutory category.

Structure that ties insignificant pre or post solution activity to a statutory category is not sufficient in overcoming the 101 issue.

11] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

2 *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7-9, 15-17 and 18, 20, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi and Heising.

#### **Regarding claims 1, 9, 17 and 18,**

Choi discloses a block-based motion compensation apparatus comprising:: a first motion compensation interpolator to read a first and a second pixel corresponding to a motion vector of an estimated current block respectively from a current and a previous frame or field inputted, and to calculate a first interpolation pixel; at least one second

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motion compensation interpolator to read a third and a fourth pixel corresponding to a motion vector estimated with respect to each of at least one peripheral block adjacent to the current block to be interpolated respectively from the inputted current and previous frame or fields(Choi, page 606, left column, lines 8-16; equation 10), and to calculate a second interpolation pixel; a candidate interpolation pixel calculator to calculate a candidate interpolation pixel by allocating a predetermined weight to the first and the second interpolation pixels(Choi, equation 12 wherein the weight is 0.5); and a final interpolation pixel selector to select one among the first interpolation pixel and the candidate interpolation pixel as a final interpolation pixel, and to output the selected final interpolation pixel (Choi, page 606, paragraph 1 on the right-hand side; equation 11-13; Fig. 7; Choi, refer to lines 8 to 16 and formula 10 in the left column of page 606, the first paragraph and formulae 11 to 13 in the right column of the same page, and Figure 7).

Choi does not disclose a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer.

However, Heising a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second

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pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer (Heising, refer to lines 15 to 21 of the left column, lines 29 to 34 and lines 35 to 36 of the right column in page 95, lines 12 to 18 of the right column in page 99, the first paragraph of the left column in page 100, Figure 2a, and formula 3 and 4).

Choi and Heising are both in the same field of endeavor of motion compensation systems. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Choi to include a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer as taught by Heising because, as is well known to a practitioner or ordinary skill in the art, the above features perform identical functions in Choi for solving the artifact reduction problem ("significantly improving coding efficiency as well as visual quality", Heising, page 93, first paragraph).

**Regarding claims 7 and 15**, the combination of Choi and Heising discloses the motion compensation apparatus of claim 1, further comprising a delayer to delay the inputted

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current frame or field for a predetermined time, and to provide the delayed frame or field to the first and the second motion compensation interpolators and the motion compensation part (Heising, Fig. 5, "delay")

**Regarding claims 8 and 16**, the combination of Choi and Heising discloses the motion compensation apparatus of claim 1, wherein the number of the provided second motion compensation interpolator is identical to the number of the peripheral blocks (Heising, page 95, right-hand column, paragraph 5).

**Regarding claim 20**, the combination of Choi and Heising discloses the method of claim 17, wherein the selecting of the discontinuous areas comprises analyzing a deviation between motion vectors of a current block and peripheral blocks (Heising, see formula 4; Heising, page 95, lines 29-37 on the right-hand side).

**Regarding claim 21**, the combination of Choi and Heising discloses the method of claim 17, further comprising selectively applying the overlap block motion compensation to non-selected areas of the image blocks to reduce blurring (Heising, lines 29 to 37 of the right column in page 95 and formula 4, page 96, paragraph 3 on the right-hand side).

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi and Heising as applied to claim 1, further in view of Ohm.

**Regarding claim 2 and 10**, while the combination of Choi and Heising discloses the motion compensation apparatus of claim 1, the combination of Choi and Heising does not disclose wherein the motion analyzer compares a deviation of the motion vectors of the current and the peripheral blocks, and when the deviation is equal to or larger than a preset threshold, outputs a signal to the final interpolation pixel selector indicating to select the candidate interpolation pixel calculated from the candidate interpolation pixel calculator as a final interpolation pixel, and when the deviation is smaller than the preset threshold, outputs a signal indicating to select the first interpolation pixel calculated from the first motion compensation interpolator as a final interpolation pixel.

Ohm teaches wherein the motion analyzer compares a deviation of the motion vectors of the current and the peripheral blocks, and when the deviation is equal to or larger than a preset threshold, outputs a signal to the final interpolation pixel selector indicating to select the candidate interpolation pixel calculated from the candidate interpolation pixel calculator as a final interpolation pixel, and when the deviation is smaller than the preset threshold, outputs a signal indicating to select the first interpolation pixel calculated from the first motion compensation interpolator as a final interpolation pixel (Ohm, page 3, last six sentences of the left hand column to the first five sentences of the right hand column).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Choi and Heising to include the method of Ohm in order to "overcome the inexact description of the motion vector field" by using an approach for "taking into account features from the neighborhood" (Ohm, abstract) and more specifically, to make use of the fact that "high differences of motion vectors usually indicate the presence of an object border" as discussed starting at the 8<sup>th</sup> line up from the bottom of the left hand column of page 3.

Claims 3-6 and corresponding claims 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 3-6 and corresponding claims 11-14, none of the references of record alone or in combination suggest or fairly teach the limitations contained therein.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELISA M. RICE whose telephone number is (571)270-1582. The examiner can normally be reached on 12:00-8:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elisa M Rice/  
Examiner, Art Unit 2624

/Vikkram Bali/  
Supervisory Patent Examiner, Art Unit 2624